

# Electrochemical Carbon Dioxide Sensor for Plant Production Environments, Phase I

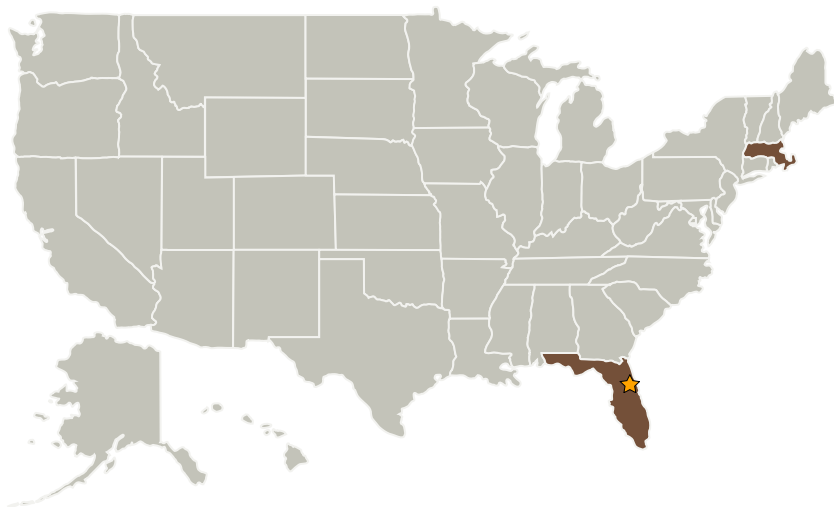
Completed Technology Project (2004 - 2004)



## Project Introduction

The aim of this proposal is to develop a low power consuming solid polymer electrolyte based, miniaturized electrochemical CO<sub>2</sub> sensor that can continuously, accurately and rapidly monitor CO<sub>2</sub> concentrations in closed or nearly closed environments for monitoring and control approaches for plant-production environments, to aid in NASA's biomass (edible food) production research. The proposed sensor will introduce a much simpler, lower cost and more accurate alternative to the existing infrared CO<sub>2</sub> measurement technology to measure CO<sub>2</sub> and study its effects on plant growth. During Phase I, in addition to concept feasibility demonstration, the ability of the proposed sensor to detect (0 - 10) % CO<sub>2</sub> in a wide temperature (15 ? 45) °C, and humidity (10 ? 99) % RH will be demonstrated. The proposed sensor will be evaluated for its fast response and continuous and uninterrupted operation for 100 hours. In Phase II the sensor will be integrated into a complete instrument, which will be small, lightweight and will allow for independent operation of the sensor complete with calibration routine, adjustable applied potential settings and digital display of numeric results. The unit will be battery operated with an AC converter and battery re-charger.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Kennedy Space Center (KSC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Giner Electrochemical Systems, LLC	Supporting Organization	Industry	Newton, Massachusetts

## Primary U.S. Work Locations

Florida	Massachusetts
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Mourad Manoukian

## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.3 Human Health and Performance
    - └ TX06.3.4 Contact-less / Wearable Human Health and Performance Monitoring